THE UNIVERSITY OF MAINE Cooperative Extension

Bulletin #2096

# Burning Wild Blueberry Land in Maine

*By Dr. Lily Calderwood, Ph.D., Wild Blueberry Specialist and Associate Professor of Horticulture, University of Maine Cooperative Extension, Jordan Parks, Wild Blueberry Research Technician, University of Maine Cooperative Extension and Leala Machesney, Extension and Research Professional, University of Maine Cooperative Extension*

## Introduction

Wild blueberries have been an important part of Maine's farming heritage for centuries. The use of prescribed fire to manage wild blueberry fields was historically, and is still today, a valuable pest and crop management tool. Burning was first practiced by the First Peoples of Canada who found that burning temporarily improved soil quality, enhanced the growing habits of berry species, and increased bud production (Chapeskie, 2001). Because 70% of the wild blueberry plant is underground, the plant can recover well from burning events (Drummond et al., 2009). Pruning wild blueberry fields is a critical management practice to maintain a two-year cropping cycle. To prune, growers can burn or mow fields after harvest. All wild blueberry fields were burn pruned until research was done using a flail mower to prune in the late 1970s (Gomez, 1988) to mitigate the high cost of heating oil and serious air quality issues. However, flail mowing was first adapted large-scale in the 1980s (Wood, 2004). Today, most wild blueberry fields are mowed, not burned. Organic growers are more likely to incorporate burn pruning than conventional growers because burning every few cycles is an important strategy to manage pest populations. The decision to mow or burn is often economic. Some years burning can be significantly more expensive than mowing-potentially four times more expensive. Burning is performed using either straw or oil as a fuel source, and the cost of these materials can vary by year. Producers must carefully consider the yield loss they may experience due to pest pressure compared to the costs associated with burning using either fuel source when choosing their pruning strategy (Nicolas Lindholm, personal communication 2025).

**Image 1.** Using straw to burn a wild blueberry field. Photo: Greta Rybus.

## Cautions

### Working with Fire

Wild blueberry landowners or farmers should not burn fields until they have been properly trained. In order to burn a wild blueberry field, you must first contact your town fire warden or receive an Open Burn Permit from the Maine Forest Service through the Maine Burn Permit System. Depending on the town you live in and the location of your field, you may not be allowed to burn. It is likely not possible to burn fields located in residential neighborhoods, close to schools, or near fragile habitats. If you can burn in your location, it is still important to create a mowed or burned perimeter to act as a fire buffer around the field. This will prevent the spread of the fire from the field to non-target locations, like a forest. It is important to gauge windspeed and know your field topography. Fire can move uphill rapidly. A burn perimeter around the field, and awareness of this habit, can help prevent forest fires and injury.

### Fire Laws and Permitting

The use of prescribed fire for residential, commercial, or agricultural purposes is regulated by the Maine Forest Service and its forest rangers, governed by Maine's open burning and wildfire prevention laws. These laws, include the requirement for obtaining an open burning permit, adhering to the conditions listed on that permit and the extinguishment of all fires can be found in M.R.S.A. Title 12, Chapter 807. The duration of the permit depends on the location and the current fire danger warning for the area.

### Blueberry Plant

Care should be taken to avoid burning too deep into the ground. If the fire reaches rhizomes in the soil, rhizomes can be damaged and stem production can be reduced (Duchesne & Wetzel, 2004). Soil organic matter, or the "organic pad", is the top layer of wild blueberry soils. This material provides habitat for micro-organisms that release nutrients for plants to use. Organic matter also holds water, acting like a sponge on top of very well-draining soils. If a burn becomes too hot or too deep, the organic matter layer can be reduced or burned off entirely. The deepest and hottest fire comes from oil burners while using straw as fuel to burn a field can mitigate the loss of organic matter (N. Lindholm, Farmer Communication, February 24, 2021) (Image 1). In the past, it was recommended to burn after every harvest. However, because of the important benefits of organic matter, the frequency of

### Burning versus Mowing

**Mowing** builds organic matter, while burning can destroy organic matter. **Burning** is an effective pest management tool, while mowing spreads pests across fields. Therefore, it is primarily organic wild blueberry farmers who burn, as it is an important pest management tool in systems that do not use synthetic pesticides.

### Summary of Maine Open Burning Laws

- No person, firm or corporation may burn out of doors without a permit from a town forest fire warden or forest ranger. (M.R.S.A. Title 12, Section 9324-5)
- All fires must be totally extinguished before leaving them. (M.R.S.A. Title 12, Section 9324-1)
- All burning must be conducted at a suitable time and in a careful and prudent manner. (M.R.S.A. Title 12, Section 9324-2)
- No person may kindle a fire on lands of another without landowner permission. (M.R.S.A. Title  No person may burn on a Red Flag Warning Day, unless authorized by exemption and with an open burning permit. Use the Maine Burn Permit System to receive permission.

burning should be assessed. Depending on the field, the pest pressure can be high, and burning is done every cycle to allow the field to produce an adequate yield (C. Nash, Farmer Communication, February 24, 2021). Other growers burn every one to three cycles to keep pest pressure down while allowing organic matter to build up (N. Lindholm, Farmer Communication, February 24, 2021). Most organic wild blueberry farmers choose to burn every other cycle or when a pest problem is clear. Burning does release carbon, a greenhouse gas, into the atmosphere but burning every few crop cycles can save the crop from insects, weeds, and disease.

## Benefits

Burning is a critical pest management practice for organic wild blueberry producers because conventional pesticides are not available for use. Burning has been found to decrease mummy berry disease by 50-60% in the year following the burn (Lambert, 1990). Spot burning can be used during the crop season to stop patches of mummy berry or insect pests from spreading to other parts of the field. Other diseases that overwinter in the soil and leaf litter may also be reduced from burning. The combination of burning and sulfur application doubled organic yields (Drummond et al., 2012) (Figure 1). Drummond et al. (2009) found that a "hard burn", where the thickness of the field organic pad is reduced, can be an effective management strategy for several insect pest species including blueberry flea beetle (Altica sylvia Malloch), blueberry spanworm (Itame argillacearia), blueberry sawfly (Neopareophora litura), blueberry gall midge (Dasineura oxycoccana), and red-striped fireworm (Aroga trialbamaculella). Additionally, research conducted in Ontario showed that wild blueberry production and stem density improved with fire intensities of 597 and 1268 kW/m (kilowatts per meter) (Duchesne & Wetzel, 2004). Fire intensity is calculated based on heat yield of the fuel, amount of fuel per area, and the rate of forward spread. 500-3000 kW/m is considered moderate fire intensity (Charles Darwin University, n.d.).

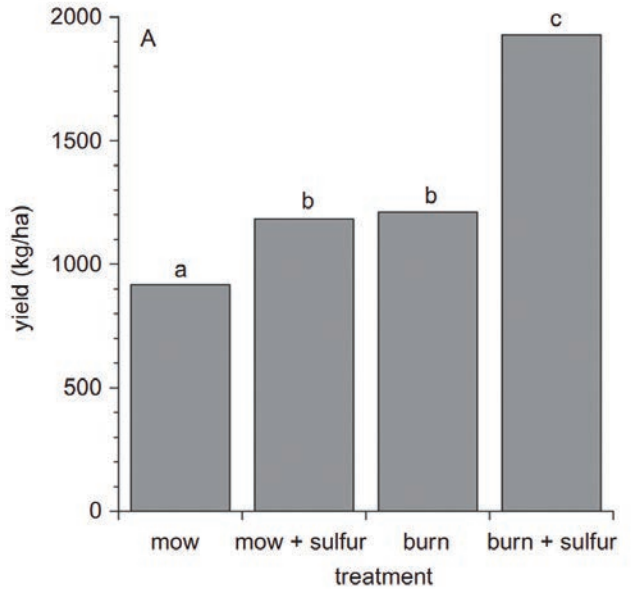


**Figure 1**. A bar chart showing the effects on wild blueberry yield from mowing, burning, and sulfur combinations. Means sharing the same letters are not statistically different (α = 0.05).

## Weather Resources

It is important that anyone conducting open burning in Maine be mindful of the risks of wildfires and that they understand what resources are available to them to help make informed decisions.

- The Maine Forest Service Wildfire Danger Report website has a map showing the predicted fire weather danger by zone and links to live Maine Forest Service weather station data.
- The National Weather Service operates offices in Gray and Caribou, ME and each creates a daily fire weather forecast for their assigned areas. The site information for each location can be found on the Caribou's Forecast Area and the Gray's Forecast Area.

## How to Burn a Wild Blueberry Field

### Timing

When to burn largely depends on weather conditions. Growers typically burn in the spring when fields have dried out and the air relative

humidity is between 30 and 35% (Courtney Hammond, personal communication 2024). Depending on the season, burning occurs between the end of March and the end of April. Burning past April may lead to a decrease in yield. Very few growers have burned using a tractor mounted oil burner in November to January in years where there is no snow cover in late fall. Burning with straw would not be possible at this time because straw settles over the winter and finding a burning crew at this time of year is very difficult. Wild blueberry farms are allowed to burn on Red Flag days but are not exempt from following Maine open fire laws.

## Permits

Obtain the proper permits, check the fire weather predictions for the area, and check the weather forecast. Use the Maine Burn Permit System to receive permission.

## Inform

Inform your neighbors about your plan to burn.

## Plan

Have a plan before starting. Do not start a fire without a plan. Survey your field, check the weather, check the wind, check your resources, make sure you have labor, and plan where to first start your fire.

## Make a Fire Line

To help prevent the fire from traveling to the wood line, it is advised to make a fire line border around the field. This can be done by mowing a 20-40 ft wide perimeter close to the ground. This reduces the fuel available for the fire to continue into the forest, allowing you to contain the fire. Another way is to burn a 20 ft. swath perimeter while having a ground crew put out the fire as the burner makes its way around the field. This creates an edge around the field that will not burn again, thus preventing the fire from inside the perimeter from spreading past the fire line.

## Water

It is required to have staffed water tanks in the field while burning. In order to burn you must have, "The presence or availability of sufficient force and equipment to control the burning" M.R.S.A. Title 12, Chapter 807. Hand pump backpack sprayers (Image 2) or tractor tanks filled with water work well. Water will put out the fire and reduce smoldering as you move across the field. It is important to have a few staff members scouting the burned section of the field to put out lingering fire. Make sure that the fire is 100% out before leaving the area. Embers can reignite, especially in mulch patches and start a forest fire (Image 3).

**Image 2.** A farmer in Hope is following a fire with a backpack water tank. Photo: Greta Rybus.

**Image 3.** Fire smoldering in mulch. Watch mulch carefully, and spray with water to put out the fire. Photo: Greta Rybus.

## Burning with Straw as Fuel

Farmers burning with straw allows for a cooler and shallower burn. However, a straw burn can get out of control more easily than the more localized oil burn that follows a tractor. Using the straw method, farmers spread straw across wild blueberry fields in the fall after harvest and use a propane lighter to light dry straw in the spring (Image 4). The straw is used to fuel the fire that moves across the field on its own. Depending on straw, weed, and blueberry coverage and field topography, the farmer may need to reignite the fire multiple times. The topography of the field matters, for example, fire can burn uphill incredibly fast. Buying straw in bulk will save money, the suppliers change with product availability, but the best place to look would be in Aroostook County or New Brunswick, Canada. The number of bails needed depends on the field and slope, but growers typically use 40 to 90 bails per acre. Dry weather conditions are essential to a successful straw burn. Burning with straw at the wrong time can lead to inadequate pruning of the blueberry and insufficient control of pests.

## Burning with Oil as Fuel

Farmers burning with oil use a burner tractor attachment (Image 6). These oil burners are hard to find as they are no longer manufactured and rarely come up for sale. Number 2 heating oil is the preferred oil, while expensive. The current average price of heating oil statewide is $3.64 per gallon (Governor's Energy Office, 2025). When using oil with a tractor mounted burner, the burn rate is approximately two gallons per minute or 100 gallons per acre (which can vary up to 150 gal/A with a field and weather conditions) at an estimated speed of 1.7 to 2.2 mph (C. Nash, Farmer Communication, February 24, 2021), which means the current price is approximately $370 dollars an acre for only the heating oil. The average price to flail mow is about $90 to $150 per acre to pay for the tractor and the operator. When using an oil burner, make sure your flame is at the correct setting to burn the material that needs to be burned. Using oil to burn is less dependent on dry weather conditions compared to straw burning. Fields with some moisture or frost can be burned with oil, but the process is slower and will require more fuel. Propane burners can be used as well but they do not burn as hot as #2 heating oil. Less fuel is used in propane burners, but the travel speed must be decreased to adequately burn weed and wild blueberry plant material. Oil burners can be hard to find on the market because no company currently manufactures them, finding used machines is the only option. Burners are also very heavy and require at least a 7,000-to-8,000-pound tractor to maneuver. However, manufacturers have switched to producing propane burners, which will have to be operated at a slower speed but use less fuel when compared to an oil burner.

**Image 4.** Nicolas Lindholm using a rake to even out straw and therefore burn coverage in his organic wild blueberry field with straw. Photo: Greta Rybus.

## Summary of Best Practices

Managing your own fire takes experience. Do not underestimate fire. Meet experienced growers at Extension field days, the UMaine Wild Blueberry Conference, or contact the Maine Forest Service to learn how to manage a burn safely and effectively. You can be held liable for damage and fire suppression costs if your fire escapes and you violate any of Maine's open burning laws.

- Plan ahead and obtain a fire weather forecast.
- Check the Maine Forest Service Wildfire Danger Report.

- Always obtain an open burning permit.
- Read and understand the conditions and restrictions on your permit.
- Ensure you have sufficient people and resources on hand to contain your fire.
- Complete a test fire before starting burn operations.
- Establish a burn line around the perimeter of the field first.
- Have a contingency plan for any slope-overs or equipment failures.
- If the fire is more severe than you expected, stop burning!
- Make sure the fire is 100% out before leaving.
- If you have questions on how to burn safely, contact the Maine Forest Service. They are glad to help you learn how to prevent wildfires.

## Acknowledgments

We extend our sincere thanks to Jeffrey B. Currier and Robert Goss of the Maine Forest Service for their valuable insights and contributions. We're also grateful to Nicolas Lindholm, Cary Nash, Courtney Hammond, and Ron Howard for generously sharing their knowledge and allowing us to visit burns on their land. Finally, our heartfelt thanks to Greta Rybus for graciously permitting the use of her photography in this bulletin.

## References

Chapeskie, A. (2001). Northern homelands, northern frontier: Linking culture and economic security in contemporary livelihoods in boreal and cold temperate forest communities in northern Canada. *United States Department of Agriculture Forest Service General Technical Report NC, 31–44.*

Charles Darwin University. (n.d.). Fundamentals of behaviour. learnline.cdu.edu.au/units/env207/fundamentals/behaviour.html#:~:text=Fire%20intensity%20(I)%20represents%20the,front%20(km%2Fh)

Drummond, F., Smagula, J., Annis, S., & Yarborough, D. (2009). *Organic wild blueberry production* (MAFES Bull No. 852, p. 43).

Drummond, F., Smagula, J. M., Yarborough, D., & Annis, S. (2012). Organic lowbush blueberry research and extension in Maine. *International Journal of Fruit Science*, 12(1–3), 216–231. https://doi.org/10.1080/15538362.2011.619258

Duchesne, L. C., & Wetzel, S. (2004). Effect of fire intensity and depth of burn on lowbush blueberry (*Vaccinium angustifolium*) and velvet leaf blueberry (*Vaccinium myrtilloides*) production in eastern Ontario. *The Canadian Field-Naturalis*t, 118(2), 195–200.

Governor's Energy Office. (2024, March 25). Heating fuel prices. State of Maine. maine.gov/energy/heating-fuel-prices

**Image 5.** Water tank.

**Image 6.** An oil rig burning wild blueberry land pulled by a tractor.

Lambert, D. (1990). Effects of pruning method on the incidence of mummy berry and other lowbush blueberry diseases. *Plant Disease*, 74(3), 199–201. https://doi.org/10.1094/PD-74-0199

Rybus, G. (2020a). Burning with straw protects the duff layer, a rich top layer of the soil [Photo]. *Atlas Obscura*. atlasobscura.com/articles/why-do-people-burn-blueberry-fields

Rybus, G. (2020b). Towards the end of the burn, the fire can be spread simply by raking the burning straw [Photo]. *Atlas Obscur*a. atlasobscura.com/articles/why-do-people-burn-blueberry-fields

Wood, G. W. (2004). The wild blueberry industry—Past. *Small Fruits Review*, 3(1–2), 11–18. doi.org/10.1300/J301v03n01_04

## Contact Information

**For additional questions about burning wild blueberry land**, contact Dr. Lily Calderwood at the University of Maine Cooperative Extension. lily.calderwood@maine.edu.

**For assistance in developing a burning plan for your wild blueberry land, contact Aliesha Black** aliesha.j.black@maine.gov with the Maine Forest Service.



**Call 800.287.0274 (in Maine), or 207.581.3188, for information on publications and program offerings from University of Maine Cooperative Extension, or visit extension.umaine.edu.**